

welding method under the condition that the tension is applied in the vertical direction. The frame member 22 is removably attached to the face plate 10 with a fitting device 23 formed of spring. The other structure of the color picture tube is similar to that of the existing color picture tube and detail description will be omitted here.

The external surface 10A of the face plate 10 is bonded with a resin film 30 formed of polyethylene terephthalate using an acrylic pressure sensitive bonding agent. This resin film 30 is given a conductivity which is enough, for example, to prevent charging of the face plate and a silicon hard coat film is formed at the external surface of the resin film.

In the 28-inch type color picture tube, when the external surface 10A of the face plate 10 is placed on the surface table so that the surface 10A of the center of the effective display area of the face plate 10 is in contact with the surface table, a gap of about 1 to 2 mm is sometimes generated between the peripheral area in the horizontal direction of the effective display area of the face plate 10 and the surface table, a curving of the external surface 10A of the face plate 10 of such a degree is within the manufacturing error tolerance range of the face plate. The face plate within the manufacturing error tolerance range of such a degree can be seen sufficiently smooth through the human eyes.

In the 28-inch type color picture tube, thickness T of the peripheral area in the horizontal direction of the effective display area of the face plate is set to 18 mm, while thickness T_0 at the center of the effective display area to 15 mm. Since the curve depicted by the internal surface 10B of the face plate 10 is set to an arc, the radius of curvature of the internal surface 10B of the face plate 10 is about 10000 mm. Since the external surface of the face plate is flat, if the internal surface of the face plate is curved in such a degree, the face plate can be seen flat also when an image is displayed. Moreover, the radius of curvature of the color selection mask is set to about 8000 mm. In the preferred embodiment 1, the pitch between the apertures 21, 21 provided in the color selection mask 20 is set to 0.56 mm at the center of the effective display area of the face plate 20 and it is then gradually widened as it goes to the peripheral area in the horizontal direction and it is finally set to 0.8 mm at the peripheral area in the horizontal direction of the effective display area of the face plate 10. Thereby, color purity in the peripheral area of the television color picture tube can be improved to a large extent.

(Embodiment 2)

In the color picture tube of the embodiment 2, thickness of the face plate 10 in the effective display area is set substantially equal as shown in FIG. 2. Here, the wording "substantially equal" means that thickness is equal within the manufacturing error tolerance range of the face plate. Namely, the internal surface 10B of the face plate 10 is formed substantially flat. Like the embodiment 1, the color selection mask 20 has the curvature projected toward the face plate 10. Also in the color picture tube of the embodiment 2, the pitch between the apertures 21, 21 provided in the color selection mask 20 is gradually widened as it goes toward the peripheral area in the horizontal direction of the face plate 10.

In the color picture tube of the embodiment 2, since the face plate 10 is formed flat, the face plate must be formed thicker than that of the embodiment 1. However, since it is provided with the color selection mask having the curvature projected toward the face plate, vibration of the color selection mask due to external vibration can be prevented effectively generation of color displacement due to the doming phenomenon can also be prevented effectively.

(Embodiment 3)

In the color picture tube of the embodiment 3, as shown in FIG. 3, the internal surface 10B of the face plate 10 of glass bulb 1 has the curvature projected toward the color selection mask 20 and the curvature of the color selection mask 20 is almost equal to the curvature of the internal surface 10B of the face plate 10. In more practical, the radius of curvature of the color selection mask 20 is within the range from 90% to 100% of the radius of curvature of the internal surface 10B of the face plate 10. In this case, the pitch between the apertures 21, 21 provided in the color selection mask is preferably be set constant without relation to the horizontal position of the face plate 10.

The present invention has been described on the basis of the preferred embodiments of the present invention, but the present invention is not limited thereto. The numerical data given in the above embodiments are only examples and these values may of course be varied and the structure of the color picture tube is also examples.

With introduction of the glass bulb for color picture tube of the present invention, not only a color picture tube having the flat surface can be realized, but also higher mechanical shock resistance characteristic of the glass panel for external shock can be realized and it is no longer required to make thicker the face plate in order to assure the sufficient strength for explosion.

In comparison with the flat type face plate, weight of the face plate can be reduced by about 10% to 20%.

Moreover, while keeping the manufacturing system and quality of the related art, the color picture tube having the flat display surface can be realized by introduction of the color picture tube of the present invention. In addition, since the color selection mask having the curvature projected toward the face plate is provided, not only vibration of color selection mask due to external vibration can be prevented but also generation of color displacement due to the doming effect can also be prevented effectively.

What is claimed is:

1. A cathode ray tube comprising:

a glass bulb in which an external surface of an effective display area of a face plate is substantially flat and a peripheral area in the horizontal direction of the effective display area of the face plate is thicker than a center of the effective display area; and

a color selection mechanism having a curvature projected toward the face plate provided opposed to an internal surface of the face plate within the glass bulb.

2. A cathode ray tube according to claim 1, wherein the internal surface of the face plate of the glass bulb has a curvature recessed toward the color selection mechanism.

3. A cathode ray tube according to claim 1, wherein the curvature of the color selection mechanism is larger than a curvature of the internal surface of the face plate.

4. A cathode ray tube according to claim 1, wherein the curvature of the color selection mechanism is almost equal to a curvature of the internal surface of the face plate.

5. A cathode ray tube according to claim 1, wherein a multiple layered resin film is bonded to the external surface of the face plate of the glass bulb.

6. A cathode ray tube according to claim 1, wherein the color selection mechanism is formed of a frame and a plurality of metal fine leads extended over the frame and the pitch of said fine metal leads is gradually widened toward a peripheral area in a horizontal direction of the face plate.

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7. A cathode ray tube comprising:

a glass bulb in which both an external surface and an internal surface of an effective display area of a face plate are substantially flat and the face plate in the effective display area is substantially uniform in thickness; and

a color selection mechanism having a curvature projected toward the face plate provided opposed to an internal surface of the face plate within the glass bulb.

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8. A cathode ray tube according to claim 7, wherein a multiple layered resin film is bonded to the external surface of the face plate of the glass bulb.

9. A cathode ray tube according to claim 7, wherein the color selection mechanism is formed of a frame and a plurality of metal fine leads extended over the frame and the pitch of said fine metal leads is gradually widened toward a peripheral area in a horizontal direction of the face plate.

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